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23474 7590 08/04/2009

FLYNN THIEL, BOUTELL & TANIS, P.C.
2026 RAMBLING ROAD
KALAMAZOO, MI 49008-1631

EXAMINER

O BRIEN, JEFFREY D

ART UNIT

PAPER NUMBER

3677

DATE MAILED: 08/04/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,917	06/06/2006	Hiroshi Sato	4700.P0331US	9109

TITLE OF INVENTION: TWO-SHAFT HINGE MECHANISM ENABLING HARNESS WIRING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/04/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

23474 7590 08/04/2009
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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE; address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,917	06/06/2006	Hitoshi Sato	4700.P0331US	9109

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/04/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
O BRIEN, JEFFREY D	3677	016-367000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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23474	7590	08/04/2009	EXAMINER	
FLYNN THIEL, BOUTELL & TANIS, P.C. 2026 RAMBLING ROAD KALAMAZOO, MI 49008-1631			O'BRIEN, JEFFREY D	
			ART UNIT	PAPER NUMBER

3677

DATE MAILED: 08/04/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 222 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 222 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/581,917

Examiner

Jeffrey O'Brien

Applicant(s)

SATO ET AL.

Art Unit

3677

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to brief filed 5/20/2009.
2. ☒ The allowed claim(s) is/are 1-12.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/Victor Batson/
Supervisory Patent Examiner, Art Unit 3677

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Terry Chapman on 7/6/2009.

The application has been amended as follows:

Claims:

1. A two-shaft hinge having a two-shaft structure, comprising:

a rotation shaft having an axially penetrating hole through which a harness wiring can pass;

an opening/closing shaft;

a rotation torque unit in which a plurality of rotation torque generating portions are provided on the rotation shaft, the rotation torque generating portions being assembled by putting a first coil spring around an outer periphery of the rotation shaft ~~having a penetrating hole~~ and by abutting a first fixing cam and a first rotating cam on both ends of the first coil spring; and

an opening/closing torque unit in which a plurality of opening/closing torque generating portions are provided on the opening/closing shaft, the opening/closing torque generating portions being assembled by putting a second coil spring around the

opening/closing shaft and by abutting a second fixing cam and a second rotating cam on both ends of the second coil spring,

an elongate hinge housing extending coaxially with the opening/closing shaft, wherein ~~an axial direction of the rotation shaft penetrates and an axial direction of the opening/closing shaft are assembled to a~~ the elongate hinge housing to be such that the axis of the rotation shaft and the axis of the opening/closing shaft are perpendicular to each other, the rotation shaft extending through the entire diameter of the elongate hinge housing, the elongate hinge housing having a first through-hole through which the rotation shaft pierces on one side of the rotation torque unit and a second through-hole through which the [[a]] harness wiring can pass on the other side of the rotation torque unit, the torque units generate a sliding torque and a click torque at rotation, and an opening/closing operation function on the rotation shaft and the opening/closing shaft, and the opening/closing torque unit is assembled to either a right side or a left side of the rotation torque unit.

2. A two-shaft hinge having a two-shaft structure, comprising:

a rotation shaft having an axially penetrating hole through which a harness wiring can pass;

an opening/closing shaft;

a rotation torque unit in which a pair of rotation torque generating portions are provided on the rotation shaft, the rotation torque generating portions being assembled by putting a first coil spring around an outer periphery of the rotation shaft ~~having a~~

~~penetrating hole~~ and by abutting a first fixing cam and a first rotating cam on both ends of the first coil spring; and

an opening/closing torque unit in which a plurality of opening/closing torque generating portions are provided on the opening/closing shaft, the opening/closing torque generating portions being assembled by putting a second coil spring around the opening/closing shaft and by abutting a second fixing cam and a second rotating cam on both ends of the second coil spring,

an elongate hinge housing extending coaxially with the opening/closing shaft, wherein ~~an axial direction of the rotation shaft penetrates and an axial direction of the opening/closing shaft are assembled to a~~ the elongate hinge housing to be such that the axis of the rotation shaft and the axis of the opening/closing shaft are perpendicular to each other, the rotation shaft extending through the entire diameter of the elongate hinge housing, the elongate hinge housing having a first through-hole through which the rotation shaft pierces on one side of the rotation torque unit and a second through-hole through which the ~~the~~ ^{[[a]]} harness wiring can pass on the other side of the rotation torque unit, the torque units generate a sliding torque and a click torque at rotation, and an opening/closing operation function on the rotation shaft and the opening/closing shaft, and the opening/closing torque unit is assembled to either a right side or a left side of the rotation torque unit.

3. The two-shaft hinge according to claim 1, wherein the rotation torque unit is assembled on the rotation shaft, and a plurality of the rotation torque generating portions are assembled on the rotation torque unit and have torque generating

operations to generate the sliding torque and the click torque by abutting the first fixing cam and the first rotating cam, the torque generating operations being different and independent to one another by combining the first fixing cam and the first rotation cam having different positions of a concave groove and a convex protrusion of the first fixing cam and the first rotation cam or by combining different numbers of the cams.

4. The two-shaft hinge according to claim 1, wherein the opening/closing torque unit is assembled on the opening/closing shaft, and a plurality of the opening/closing torque generating portions are assembled on the opening/closing torque unit and have torque generating operations to generate the sliding torque and the click torque by abutting the second fixing cam and the second rotating cam, the torque generating operations being different and independent to one another by combining the second fixing cam and the second rotation cam having different positions of a concave groove and a convex protrusion of the second fixing cam and the second rotation cam or by combining different numbers of the cams.

5. The two-shaft hinge according to claim 1, wherein a cross-section of a part of the rotation shaft and the opening/closing shaft is other than a circle, or is formed to be a quadrangle or a shape having a major axis and a minor axis, allowing the first and the second fixing cams for rotation and opening/closing, which are used respectively in the rotation torque generating portions and the opening/closing torque generating portions, to move respectively in the axial direction of the rotation shaft and the axial direction of the opening/closing shaft, but inhibiting the first and the second fixing cams from rotating with respect to the rotation shaft.

6. The two-shaft hinge according to claim 1 further comprising a stopper mechanism to restrict a rotation angle and an opening/closing angle of the rotation shaft and the opening/closing shaft so that rotation ranges of the rotation shaft and the opening/closing shaft are restricted.

7. The two-shaft hinge according to claim 1 further comprising a disc spring, a waved plate spring, or a thin plate spring in place of the first and the second coil springs which generate an abutting force in the torque generating portions used in the rotation torque unit and the opening/closing torque unit.

8. The two-shaft hinge according to claim 1, wherein the rotation shaft having the penetrating hole in which a through-hole is provided at a center of the rotation shaft, in order to enable the harness wiring.

9. The two-shaft hinge according to claim 1, wherein a case for the rotation shaft and a case for the opening/closing shaft in each of which an outer periphery has a groove or a deformed cross-section other than a circle are fitted with or fixed to the first and the second rotating cams in each of which an outer periphery has a protrusion or a deformed cross-section, in order to effectively transmit a sliding torque force and a click torque force, which are generated in the first and the second rotating cams used on the rotation shaft and the opening/closing shaft, to the elongate hinge housing.

10. The two-shaft hinge according to claim 1, wherein the first rotating cam used in the rotation torque generating portions is configured to be a bottom portion to which the rotation torque unit is fitted and attached in the elongate hinge housing, to reduce

the number of components and size, and improve the strength of the elongate hinge housing.

11. The two-shaft hinge according to claim 1, wherein the rotation torque unit and the opening/closing torque unit are assembled as an independent unit, the torque units being fitted and attached to or screwed into the elongate hinge housing in which a means for fitting or screwing to fix is provided in advance.

12. The two-shaft hinge according to claim 1 further comprising a fixing base component adhered to the rotation shaft for mounting and fixing the two-shaft hinge to a device chassis, wherein the two-shaft hinge is fixed by the base component.

2. The following is an examiner's statement of reasons for allowance: the amendment to independent claims 1 and 2 further defines the hinge housing as being elongate and the elongate housing extending coaxially with the opening/closing shaft. The limitation of the rotation shaft extending through the entire diameter of the elongate hinge housing as well as being perpendicular to the opening/closing shaft further defines the hinge. These limitations in combination with all the other limitations of independent claims 1 and 2, specifically the cam structure, define the invention over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey O'Brien whose telephone number is (571)270-3655. The examiner can normally be reached on Monday through Friday 8:00am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Victor Batson can be reached on 571-272-6987. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor Batson/
Supervisory Patent Examiner, Art Unit 3677

/JO/
JO